

*PREDICTING THE RELATIVE EFFICACY OF THREE
PRESENTATION METHODS FOR ASSESSING PREFERENCES OF
PERSONS WITH DEVELOPMENTAL DISABILITIES*

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Choices were presented to 9 individuals with developmental disabilities using a two-choice format. Each pair of items, selected based on prior preference assessment, was presented to each participant in three conditions (actual items, pictures of the items, and spoken-name presentation) using a reversal design. The evaluation was conducted using food items, and was then repeated using nonfood items. The participants were also given a test to measure their skills on discrimination tasks ranging in difficulty from simple to conditional discriminations. The participants' abilities to make consistent choices with food and nonfood items were predicted, with 94% accuracy, by their discrimination skills. The findings suggest that presentation methods can affect the accuracy of a choice assessment, and that the systematic assessment of basic discrimination skills can be used to predict the effectiveness of different presentation methods in this population.

DESCRIPTORS: developmental disabilities, preference assessment, discrimination assessment, ABLA test

The opportunity to make choices is important for improving the quality of life and increasing the sense of control experienced by persons with developmental disabilities. Parsons and Reid (1990) reported that, although the opportunity to make choices is essential to one's well being, persons with developmental disabilities do not receive opportunities to make choices as frequently as the rest of the population. However, individuals with developmental disabilities require carefully structured choice-making opportunities. For example, whereas some persons may possess the skills needed to choose an object after hearing a spoken description of the options, others may need to view pic-

tures of objects in order to make a meaningful choice. Others may make reliable choices only when the actual objects are presented.

In presenting choices, there are clear practical advantages for using pictures over objects and for using spoken words over pictures. For example, compared to objects, pictures permit the representation of less manipulable objects (e.g., a television set, a treadmill) and events and activities that involve many stimuli and behaviors (e.g., going for a walk, eating at a restaurant). For persons with functional receptive language, spoken presentation of choices offers further convenience and increased choice options, in addition to more normalized interactions.

Given that basic discrimination skills are essential to successful choice making, it may be important to determine effective choice-presentation procedures based on the person's discrimination skills. One way to accomplish this is to present choices along a continuum of difficulty. If a person is consistently able to indicate a preference at one

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level of the continuum, a more advanced level of choice making could then be assessed (Parsons, Harper, Jensen, & Reid, 1997). Even more preferable for staff who work with individuals with developmental disabilities would be the capability to accurately predict which choice-presentation method would be most appropriate for individual clients based on a systematic assessment of their discrimination skills. The present study examined this possibility.

Presenting a choice in a preference assessment can be viewed as a prompt or discriminative stimulus designed to occasion a specific response (e.g., choosing the more preferred stimulus). If the choice-presentation method is too complex for the individual's discriminative repertoire (e.g., using a spoken presentation method for a child with markedly impaired receptive language skills), the relevant response will not occur consistently and the accuracy of the preference assessment is likely to be compromised. Richman et al. (2001) recently developed an assessment strategy for identifying gestural and spoken prompts that matched the discriminative repertoire of children with borderline to low average intellectual functioning and language delays. They demonstrated that prompts assessed as being within the child's repertoire during an analogue assessment effectively occasioned correct responding during play and academic tasks, whereas prompts assessed as being beyond the child's repertoire did not. In the current investigation, we extended this line of research by assessing a broader range of discriminative repertoires among individuals with mental retardation and applying the results to a different target response (choice responses during preference assessments).

The purpose of this study was to evaluate how choice responding was influenced by different methods of choice presentation (object, picture, and verbal description) in persons with different discrimination skills.

We hypothesized that object presentation requires at least a simple visual discrimination (i.e., being able to select a preferred item independent of its position); picture presentation requires a visual conditional discrimination (i.e., being able to relate or match the picture to the object); and spoken presentation requires an auditory-visual conditional discrimination (i.e., being able to relate the spoken description to the object). Thus, individuals with only simple visual discriminations would be able to choose their preferred items when the actual items (objects) were presented, but not when the choices were presented as pictures or by spoken description only; individuals with both simple visual and visual conditional discriminations would be able to choose their preferred items with both the object and picture methods, but not when the choices were presented via spoken words; and individuals who could perform all three discriminations would be able to choose their preferred items with all three methods.

METHOD

Participants and Setting

Participants were nine individuals with developmental disabilities. They were selected based on an assessment of their discrimination skills using the Assessment of Basic Learning Abilities (ABLA) test (described below) (Kerr, Meyerson, & Flora, 1977; Martin & Yu, 2000). Participants 1 through 3 were 25, 28, and 17 years old, respectively. Participant 1 was a man who had been diagnosed with profound mental retardation; Participants 2 and 3 were women who had been diagnosed with severe mental retardation. All 3 passed the visual discrimination assessment and failed both the visual matching-to-sample and auditory discrimination assessments on the ABLA test. Participants 4 through 6 were 43, 28, and 34 years old, respectively. Participants 4 and 5 were men

who had been diagnosed with severe mental retardation; Participant 6 was a woman who had been diagnosed with profound mental retardation. All 3 passed both visual and matching-to-sample discrimination assessments and failed the auditory-visual discrimination assessment on the ABLA test. Participants 7 through 9 were 31, 38, and 44 years old, respectively. Participant 7 was a woman who had been diagnosed with severe mental retardation; Participants 8 and 9, a man and a woman, respectively, had been diagnosed with mild mental retardation. All 3 passed visual, matching, and auditory-visual discrimination assessments on the ABLA test.

Sessions were conducted either in an assessment room at the St. Amant Centre or in a room at the participant's home. During all sessions, the participant sat across a table from the tester. An additional observer was present during some sessions to conduct reliability assessments.

General Research Plan and Design

Following an assessment of basic discrimination skills, each participant received a preference assessment using food items. The high- and low-preference items identified during the preference assessment were then used to evaluate the three presentation methods in a reversal design. Following the evaluation using food items, the preference assessment and evaluation of presentation methods were repeated using nonfood items.

Discrimination Skills Assessment

Each participant was screened using the ABLA test (Kerr et al., 1977), which assesses the ease or difficulty with which a participant is able to learn a simple imitation (Level 1), a two-choice visual discrimination in which position is a relevant cue (Level 2), a two-choice visual discrimination (Level 3), a two-choice visual quasi-identity match-to-sample discrimination (Level 4), a two-choice auditory discrimination with position

as a relevant cue (Level 5), and a two-choice auditory-visual combined discrimination (Level 6). The ABLA tasks have been shown to be hierarchically related, have high inter-tester and test-retest reliability, and have high predictive validity; the test can be administered in approximately 30 min (Martin & Yu, 2000).

For the present study, the three discriminations of interest involved ABLA Levels 3, 4, and 6. For the Level 3 task, the participant was required to place a piece of foam with neutral color into the same container (e.g., yellow can) when presented with a yellow can and a red box in randomly alternated left-right positions. For the Level 4 discrimination, the participant was required to put a manipulandum into the matching container (e.g., a yellow cylinder in the yellow can and a red cube in the red box). For the Level 6 discrimination, the participant was required to place a piece of foam into the container that was verbally requested by the tester (e.g., "yellow can" or "red box"). For all tasks, correct responses were reinforced with praise and an edible item, and incorrect responses were followed by a correction procedure (a demonstration, guided practice, and an opportunity to respond independently). Eight consecutive correct responses defined a pass on a discrimination task, and eight cumulative errors defined a fail.

Preference Assessment and Selection of Choice Items

A preference assessment was conducted using the paired-comparison procedure (Fisher et al., 1992) for six food items. Items selected for inclusion were based on (a) recommendations from caregivers, (b) availability and ease of presentation, and (c) an attempt to include both preferred and less preferred food items. The most and least frequently chosen food items during the preference assessment were the two edible items

used during the object, picture, and verbal presentations. The same preference assessment and selection procedures were carried out for nonfood items. Throughout the study, a choice response was defined as an individual touching or pointing to one of the two options presented. A preference was defined as a participant selecting the same item on a least 70% of all trials.

Presentation Methods

The three presentation methods (object, picture, and spoken) were evaluated using a reversal design. At least two sessions were conducted during each phase, and each session consisted of 10 trials. The right-left positions of the two-choice options were counterbalanced across trials within each session.

Object presentation. At the beginning of each session, the participant was prompted to sample each food item. When nonfood items were presented, the participant was prompted to touch each item. Next, during each trial, the tester placed the two items in front of the participant and asked him or her to “pick one” without saying the items’ names. When an edible item was chosen, the participant was allowed to consume it, and the nonchosen item was removed from the table. For nonfood items, the participant was given access to the chosen item for approximately 1 min, and the nonchosen object was removed.

Picture presentation. The trials were conducted in the same manner as the object phase, except that realistic color pictures (approximately 20 cm by 25 cm) of the items were presented instead of the actual items. At the beginning of each session, the participant was shown each picture and was then presented with the corresponding item. During subsequent assessment trials, the tester placed the two pictures in front of the participant and asked him or her to “pick one” without saying the items’ names. The participant was given the food item to consume

that corresponded to the selected picture. For nonfood items, the participant was given access to the chosen item for approximately 1 min.

Spoken presentation. During this condition, the tester presented the participant with two identical opaque containers, each of which concealed an item inside. At the beginning of each session, the tester stated the name of the item while pointing to the corresponding container concealing that item, and then opened the container and gave the item to the participant. This was then repeated with the second container and item. Thereafter, on each assessment trial, the tester stated the name of each item while pointing to the corresponding container, before asking the participant to “pick one.” The order in which the names were stated was counterbalanced across trials. For both food and nonfood items, the participant was given the item from the selected container on each trial.

Interobserver and Procedural Reliabilities

Interobserver reliability checks for choice responses were conducted during 75% of the sessions with food items and 32% of the sessions for nonfood items by an observer who independently recorded the choices made by the participant. A trial was considered an agreement if the tester and the observer recorded the same response and a disagreement if they did not. Interobserver reliability was calculated for each session by dividing the number of agreements by the total number of agreements plus disagreements and multiplying by 100%. The observer also assessed procedural reliability using a predefined checklist of steps during reliability checks. The steps included prompting the participant to sample each item; holding the items at the participant’s eye level; placing the items on the table in the correct left-right position; asking the participant to “pick one”; giving the participant 10 s to

choose his or her preferred item; repeating the verbal prompt if no response was made after 10 s; and removing the nonchosen item after a choice was made. A trial was considered an agreement if the tester and observer both recorded that the steps occurred correctly; otherwise, it was a disagreement. Procedural reliability was calculated for each session using the same formula as for interobserver reliability. Interobserver and procedural reliability scores were 100% across all sessions observed.

RESULTS

Figure 1 shows the percentage of choice responses to the preferred food items (as demonstrated during the preference assessment) for each participant during each presentation method. As predicted, Participants 1 and 2, who functioned at ABLA Level 3, selected their preferred items consistently (greater than 70%) when the actual objects were used as choice options but not when pictures or spoken cues were used. However, an incongruity was found in the performance of Participant 3 (ABLA Level 3), who was able to select her preferred item consistently in the object phase (as predicted) and the picture phase (not predicted) but not when spoken cues were used (as predicted). As predicted, Participants 4 through 6, who functioned at ABLA Level 4, selected their preferred items consistently when choices were given as objects and pictures but not when spoken cues were used; Participants 7 through 9, who functioned at ABLA Level 6, selected their preferred items with all three presentation methods, as predicted.

Results obtained for nonfood items are shown in Figure 2. As predicted, Participants 1 and 2, who functioned at ABLA Level 3, demonstrated a consistent preference in the object phase but not in the picture or spoken phases. However, as with food items, an incongruity was observed in the performance

of Participant 3, who was able to make choices consistent with her preference in both the object and picture phases. As predicted, Participant 5 demonstrated a consistent preference in the object and picture phases and not in the spoken phase. However, inconsistencies were found for Participants 4 and 6, who made choices consistent with their preferences only in the object phases. Moreover, Participant 4 did not demonstrate a preference in the last two object phases. Given that both Participants 4 and 6 had demonstrated a consistent preference with food items and that food might be a more powerful reinforcer than the nonfood items (e.g., Bojak & Carr, 1999), it was possible that motivation might have accounted for the difference in the picture phase between food and nonfood items. For Participant 4, the loss of consistent choice responding in the last two nonfood object phases also pointed to a possible change in preference.

To shed light on these possibilities, we replicated the object, picture, and spoken phases with food for Participants 4 and 6 (last three bars in Figure 2). The choice responses of these participants during the food replications were similar to their previous patterns shown in Figure 1 (i.e., both participants made choices consistent with their preferences in the object and picture conditions but not in the spoken condition). Finally, as predicted, Participants 7 through 9, who passed all three ABLA levels, chose items consistent with their preference assessments in all three conditions.

DISCUSSION

When participants were given a choice between high- and low-preference edible items in object, picture, and spoken phases, their ability to consistently choose their high-preference edible item was predicted by their discrimination skills as measured on the

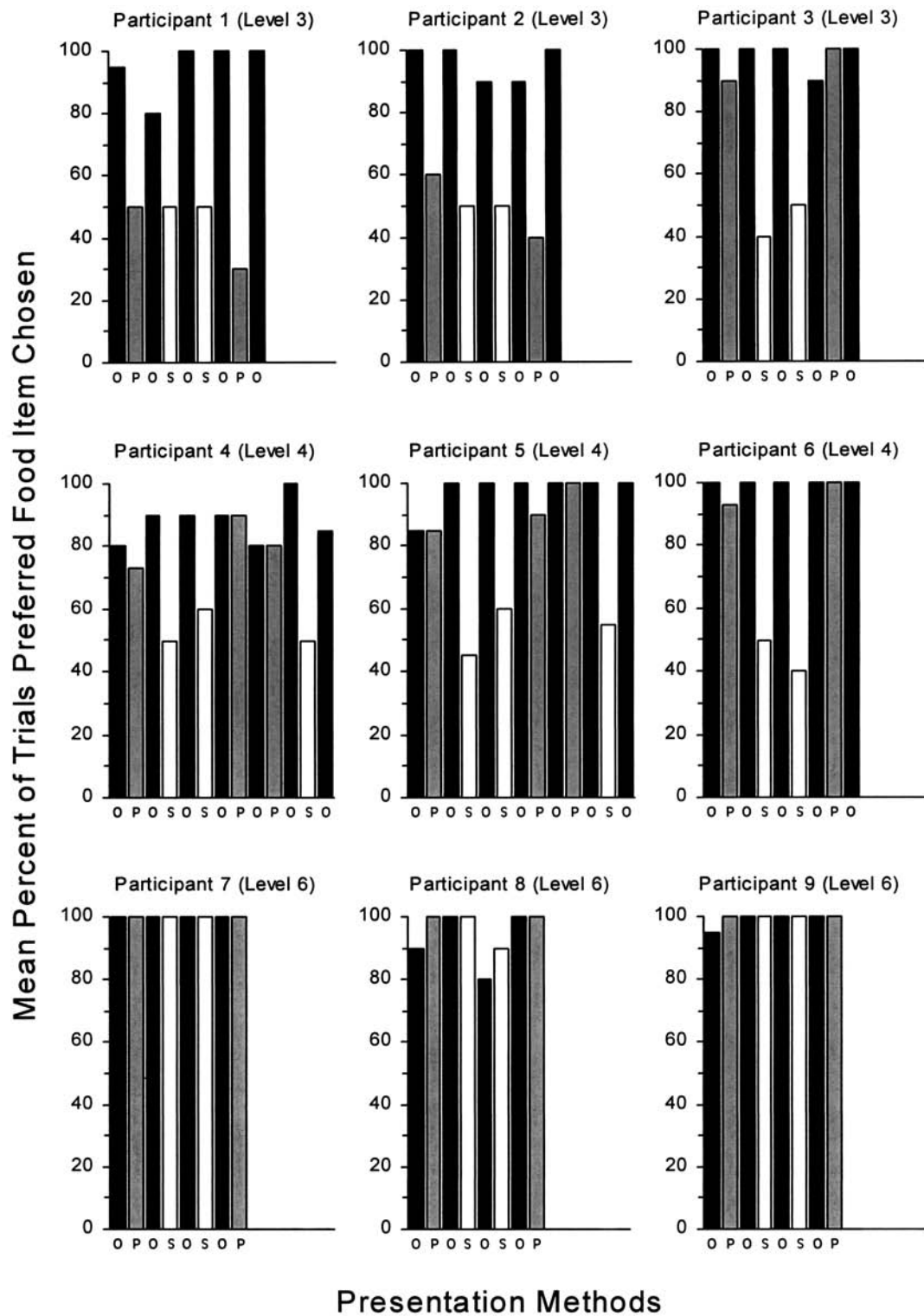


Figure 1. Mean percentage of trials per session in which the participants chose the preferred food item during the object (O), picture (P), and spoken (S) phases.

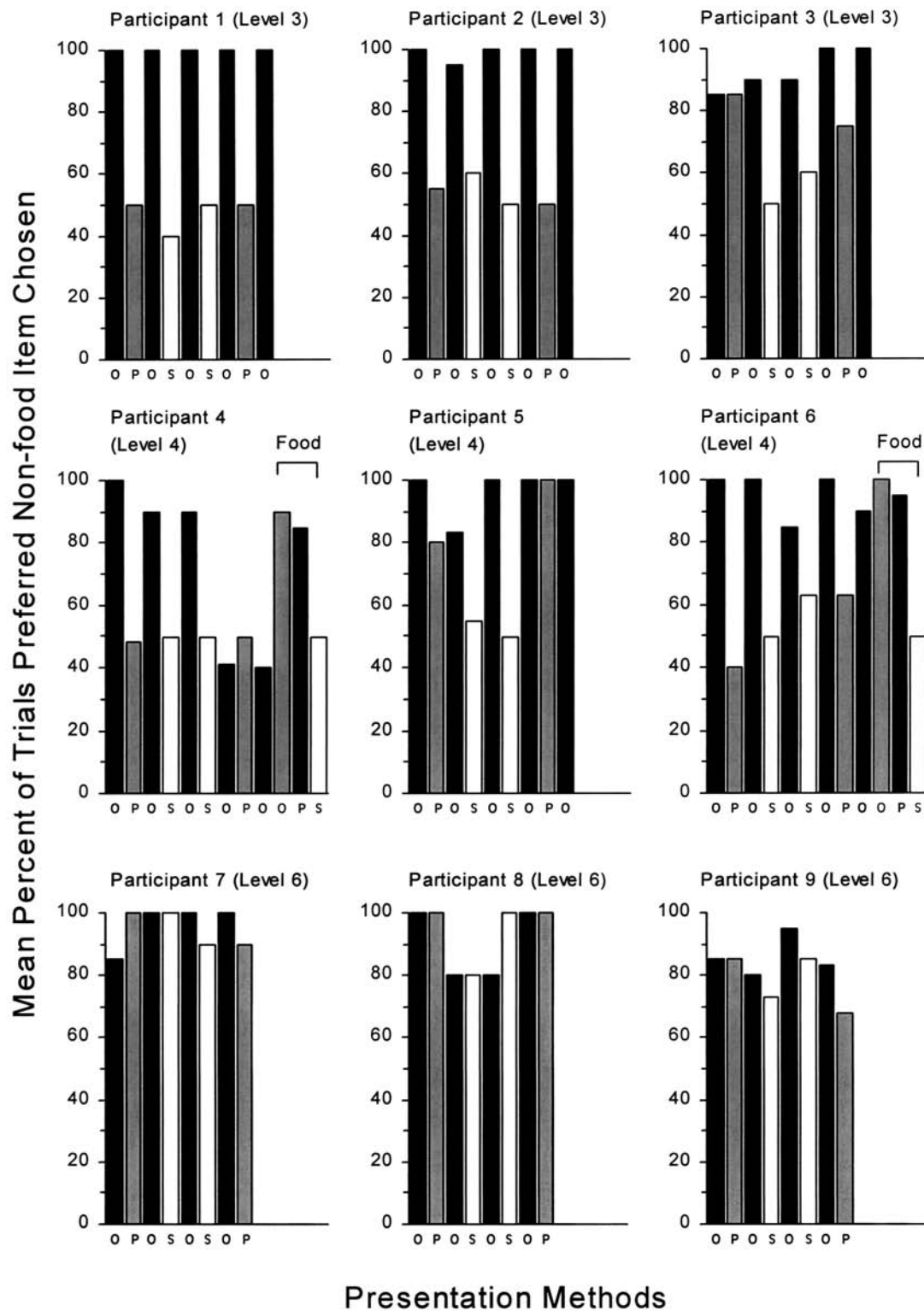


Figure 2. Mean percentage of trials per session in which the participants chose the preferred nonfood item during the object (O), picture (P), and spoken (S) phases. The last three bars for Participants 4 and 6 represent reversal to food items.

ABLA test for 98% of the experimental conditions (84 of 86 trials). When participants were given a choice between high- and low-preference nonfood items in the object, picture, and spoken conditions, their ability to consistently choose their preferred item was predicted by the ABLA test during 90% of the phases (70 of 78 trials). The results suggest that a systematic assessment of basic discrimination skills such as the ABLA test could be a useful tool to help select an effective method of choice presentation for persons with severe and moderate mental retardation. Also, the results could not have been predicted by the participants' levels of mental retardation.

Previous research has shown that the discrimination skills of individuals with developmental disabilities need to be taken into account in selecting work tasks (Vause *et al.*, 2000; Vause, Martin, & Yu, 1999) and instructional cues (Laforce & Feldman, 2000). The present study suggests that we need to do the same when providing choice opportunities. Matching the appropriate choice-presentation method to the person's discrimination skill is important for several reasons. First, there is an increasing emphasis on providing choice opportunities to people with developmental disabilities and measuring stability of preferences over time (Zhou, Iwata, Goff, & Shore, 2001). However, the results of this study showed that choice opportunities, if they are to be meaningful, must be provided in a way that is matched to the client's discrimination skills. Presenting choices in a format that is beyond the client's discrimination skills would be akin to presenting them in an unfamiliar language. Second, choice-presentation methods that are beyond the client's discrimination skills may lead to two erroneous conclusions: that the person is unable to choose or that the person does not have a preference among the options presented. The first conclusion underestimates the client's ability to choose

and therefore may limit future choice opportunities. The second may result in using a less preferred or an entirely ineffective reinforcer if one of the choice options is arbitrarily selected by the trainer.

Several limitations in the present results need to be addressed in future research. First, the choice stimuli used in the study were limited to items often used as reinforcers. Generality of the results to other stimuli, such as choice between work tasks, needs to be examined. Second, although pictures or spoken presentations have the potential to depict less manipulable objects or activities, the choice stimuli used in this study were confined to manipulable objects. Third, in addition to replicating the present results with more participants, future research could also study the predictive relation between discrimination skills and presentation methods functionally. For example, research might investigate whether individuals at Level 3 (e.g., Participants 1 through 3 in this study) could respond to picture and spoken presentations consistently after being trained to pass the ABLA Levels 4 and 6 discriminations in a multiple baseline design. Fourth, motivation was suggested as a possible variable that may have influenced choice consistency between food and nonfood items for Participants 4 and 6. Additional research is needed to isolate motivational effects. For example, future research might examine whether a person will exhibit more consistent choices between items with a large difference in preference than between items with a smaller difference in preference while stimulus type is controlled.

A current movement in the field of developmental disabilities is to promote self-determination by enhancing choice-making opportunities. Researchers have reported that individuals with severe and profound disabilities, who have limited or no communication skills, can indicate their preferences for reinforcers (e.g., Green, Reid, Can-

ipe, & Gardner, 1991; Green et al., 1988; Parsons et al., 1997; Parsons & Reid, 1990; Wacker, Berg, Wiggins, Muldoon, & Cavanaugh, 1985). Our results not only support this contention but also suggest the need to systematically assess the conditions under which a person is able to express his or her preferences.

REFERENCES

- Bojak, L. S., & Carr, E. J. (1999). On the displacement of leisure items by food during multiple stimulus preference assessments. *Journal of Applied Behavior Analysis*, 32, 515–518.
- Fisher, W. W., Piazza, C. C., Bowman, L. G., Hagoopian, L. P., Owens, J. C., & Slevin, I. (1992). A comparison of two approaches for identifying reinforcers for persons with severe and profound disabilities. *Journal of Applied Behavior Analysis*, 25, 491–498.
- Green, C. W., Reid, D. H., Canipe, V. S., & Gardner, S. M. (1991). A comprehensive evaluation of reinforcer identification processes for persons with profound multiple handicaps. *Journal of Applied Behavior Analysis*, 24, 537–552.
- Green, C. W., Reid, D. H., White, L. K., Halford, R. C., Brittain, D. P., & Gardner, S. M. (1988). Identifying the reinforcers for persons with profound handicaps: Staff opinions versus systematic assessment of preferences. *Journal of Applied Behavior Analysis*, 21, 31–43.
- Kerr, N., Meyerson, L., & Flora, J. (1977). The measurement of motor, visual and auditory discrimination skills. *Rehabilitation Psychology*, 24, 95–112.
- Laforce, J. C., & Feldman, M. A. (2000). Role of discrimination ability in the cooperative behaviour of persons with developmental disabilities. *Journal on Developmental Disabilities*, 7, 156–170.
- Martin, G., & Yu, D. (2000). Overview of research on the Assessment of Basic Learning Abilities test [Special Issue]. *Journal on Developmental Disabilities*, 7(2), 10–36.
- Parsons, M. B., Harper, V. N., Jensen, J. M., & Reid, D. H. (1997). Assisting older adults with severe disabilities in expressing leisure preferences: A protocol for determining choice-making skills. *Research in Developmental Disabilities*, 18, 113–126.
- Parsons, M. B., & Reid, D. H. (1990). Assessing food preference among persons with profound mental retardation: Providing opportunities to make choices. *Journal of Applied Behavior Analysis*, 23, 183–195.
- Richman, D. M., Wacker, D. P., Cooper-Brown, L. J., Kayser, K., Crosland, K., Stephens, T. J., & Asmus, J. (2001). Stimulus characteristics within directives: Effects on accuracy of task completion. *Journal of Applied Behavior Analysis*, 34, 289–312.
- Vause, T., Martin, G. L., Cornick, A., Harapiak, S., Chong, I., Yu, D., & Garinger, J. (2000). Training tasks assignments and aberrant behavior of persons with developmental disabilities. *Journal on Developmental Disabilities*, 7(2), 37–53.
- Vause, T., Martin, G., & Yu, D. (1999). Aberrant behavior of persons with developmental disabilities as a function of the characteristics of training tasks. *International Journal of Rehabilitation Research*, 22, 321–325.
- Wacker, D. P., Berg, W. K., Wiggins, B., Muldoon, M., & Cavanaugh, J. (1985). Evaluation of reinforcer preferences for profoundly handicapped students. *Journal of Applied Behavior Analysis*, 18, 173–178.
- Zhou, L., Iwata, B. A., Goff, G. A., & Shore, B. A. (2001). A longitudinal analysis of leisure-item preferences. *Journal of Applied Behavior Analysis*, 34, 179–184.

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STUDY QUESTIONS

1. Describe the three methods of stimulus presentation evaluated in this study and the potential advantages of each.
2. What were the participant selection criteria, and why were these criteria important?
3. Describe the procedures used for presenting stimuli.

4. What type of experimental arrangement was used to compare the three presentation methods?
5. Summarize the results of the study with respect to food preferences.
6. How did the authors explain the findings observed for Participants 4 and 6, in which there was a discrepancy in results during the picture phase for food and nonfood items? What other manipulation was included for these participants?
7. What are some practical implications of the results of this study?
8. What kinds of interpretive errors could be made when an individual is incapable of making discriminations based on the manner in which stimuli are presented?

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